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10/578,841	01/26/2007	Shinji Yasuhara	291014US3PCT	3757
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER ALTUN, NURI B	
			ART UNIT 4165	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/578,841	Applicant(s) YASUHARA ET AL.	
	Examiner Nuri Boran ALTUN	Art Unit 4165	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/21/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This communication is a first Office Action Non-Final rejection on the merits.

Claims 1-16, as originally filed, are currently pending and have been considered below.

Claim Objections

1. Claim 14 is objected to because of the following informalities:

Last word of claim 14 recites “lows” which appears to be a misspelling of “rows”.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

First sentence of second paragraph in claim 1 recites “fixing of pins to the front and back insertion parts are performed by fitting by mechanical press-in, shrink-fitting or cool-fitting...” It is not clear if the intention is to fit the parts by mechanical press-in and either by shrink-fitting or cool-fitting; or fitting by one of the above three methods. The claims have been interpreted as requiring any one of the three methods.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims **1-4 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Rooij et al. (5,728,021)**, in view of **Sakamoto et al. (6,969,332)**.

As per claims 1 and 2, Van Rooij et al. teach a power transmission chain (see title) including;

a plurality of links (33)

having front (35) and back insertion parts (37)

into which pins (45) are inserted (col.4, lines 13-14);

and a plurality of first pins (45) and a plurality of second pins (47)

for connecting the links aligned in a chain width direction so as to be bendable in a longitudinal direction (col.4, lines 11-13, lines 26-29)

such that a front insertion part of one link and a back insertion part of another link correspond to each other (col.4, lines 9-13)

in which a first pin fixed to a front insertion part of one link and movably fitted in a back insertion part of another link and a second pin movably fitted in the front insertion part of the one link and fixed to the back insertion part of the other link move relatively in a rolling contacting manner so as to enable bending in a longitudinal direction between the links (col.4, lines 14-21),

wherein fixing of pins to the front and back insertion parts are performed by fitting by mechanical press-in (col.4, lines 21-22) (Claims 1 and 2),

However, Van Rooij et al. fail to teach at least one of the following conditions being satisfied;

a condition that a difference in dimension is 0.005 mm to 0.1 mm.

a condition that maximum tensile stress in a periphery of the insertion part after fitting is not more than 1000 Mpa;

and stress in the periphery of the insertion part after fitting is 3 to 80% of stress in an elastic modification limit.

Sakamoto et al. teach a silent chain having the condition that a difference in dimension (press-in margin) is approximately 0.2 mm (col.3 lines 64-65, col.6 line 17, and col.6 lines 19-20) (Claims 1 and 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission chain of Van Rooij et al. to include the difference dimension taught by Sakamoto et al. in order to provide better fitting of the parts and expect them to have the same outcome because the ranges are sufficiently close to each other. Further, although ranges do not overlap, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties (*See MPEP 2144.05 I*).

Further it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain to have the condition that a difference in dimension (press-in margin) to be approximately .005-.1 mm in order to optimize link

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strength. *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

As per claims 3 and 4, Van Rooij et al. teach the fitting being performed by mechanical press-in (col.4, lines 21-22) (Claims 3 and 4), but fail to teach the maximum tensile stress in the periphery of the insertion part after press-in being not more than 1000 MPa (Claim 3) and the stress in the periphery of the insertion part after press-in being 3 to 80% of the stress in the elastic modification limit (Claim 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain having the maximum tensile stress in the periphery of the insertion part after press-in being not more than 1000 MPa (Claim 3) and the stress in the periphery of the insertion part after press-in to be in 3 to 80% of the stress in the elastic modification limit (Claim 4) in order to optimize the link strength. Further, *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

As per claim 11, Van Rooij et al. teach a power transmission device comprising;
a first pulley including a sheave face in a conical surface shape;
a second pulley including a sheave face in a conical surface shape;
and a power transmission chain provided over the first pulley and the second pulley,

wherein the power transmission chain is according to any one of claims 1 to 10 (col.4, lines 37-45).

6. Claims **5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Rooij et al. (5,728,021)**, in view of **Mercier (2,844,042)**, and further in view of **Sakamoto et al. (6,969,332)**.

As per claim 5, Van Rooij et al. teach all structural elements of the claimed invention, as mentioned above, but fail to explicitly disclose fitting being performed by shrink-fitting and a difference in dimension between the pin and the insertion part before starting shrink-fitting being 0.005 mm to 0.1 mm..

Mercier teaches a chain having the concept of fitting being performed by shrink-fitting (col.3 lines 51-59),

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain of Van Rooij et al. to include fixing of pins taught by Mercier in order to have a firmer connection between parts.

The Van Rooij et al. and Mercier combination teaches all the structural elements of the claimed invention, as mentioned above, but fails to teach a difference in dimension between the pin and the insertion part before starting shrink-fitting being 0.005 mm to 0.1 mm.

Sakamoto et al. teach a silent chain having a margin between pin and insertion part before fitting being approximately 0.2 mm (col.3 lines 64-64, col.6 line 17, col.6 lines 19-20).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Van Rooij et al. and Mercier to

include the difference dimension taught by Sakamoto et al. in order to provide better fitting of the parts.

Further it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain to have the margin between pin and insertion part before fitting to be approximately 0.005-.1 mm in order to optimize link strength. *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

As per claims 6 and 7, The Van Rooij et al. and Mercier combination teaches all the structural elements of the claimed invention, as mentioned above, but fails to teach the maximum tensile stress in the periphery of the insertion part after completing shrink-fitting being not more than 1000 MPa (Claim 6) and the stress in the periphery of the insertion part after completing shrink-fitting being 3 to 80% of the stress in the elastic deformation limit (Claim 7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain having the maximum tensile stress in the periphery of the insertion part after shrink-fitting being not more than 1000 MPa (Claim 6) and the stress in the periphery of the insertion part after shrink-fitting to be in 3 to 80% of the stress in the elastic deformation limit (Claim 7) in order to optimize the link strength.

7. Claims **8-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Rooij et al. (5,728,021)**, in view of **Forster et al. (6,006,514)**, and further in view of **Sakamoto et al. (6,969,332)**.

As per claim 8, Van Rooij et al. teach all structural elements of the claimed invention, as mentioned above, but fail to explicitly disclose the fitting being performed by cool-fitting, and a difference in dimension between the pin and the insertion part before starting the cool-fitting is 0.005 mm to 0.1 mm.

Forster et al. teach a link-shape and chain link assembly method with the concept of fitting being performed by cool-fitting (col.5, lines 9-11).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain of Van Rooij et al. to include fitting method taught by Forster et al. in order to provide more efficient structural integrity.

The Van Rooij et al. and Forster et al. combination teaches all the structural elements of the claimed invention, as mentioned above, but fails to teach a difference in dimension between the pin and the insertion part before starting the cool-fitting is 0.005 mm to 0.1 mm.

Sakamoto et al. teach a silent chain having a dimension margin between pin and insertion part before fitting being approximately 0.2 mm (col.3 lines 64-64, col.6 line 17, col.6 lines 19-20).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Van Rooij et al. and Forster et al. to include the difference dimension taught by Sakamoto et al. in order to provide better fitting of the parts.

Further it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain to have a dimension margin between pin

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and insertion part before fitting being approximately .005-.1 mm in order to optimize link strength. *MPEP 2144.05 II A* states that it is not inventive to discover the optimum or workable ranges by routine experimentation.

As per claims 9 and 10, The Van Rooij et al. and Mercier combination teaches all the structural elements of the claimed invention, as mentioned above, but fails to teach the maximum tensile stress in the periphery of the insertion part after completing cool-fitting being not more than 1000 MPa (Claim 9) and the stress in the periphery of the insertion part after completing cool-fitting being 3 to 80% of the stress in the elastic deformation limit (Claim 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain having the maximum tensile stress in the periphery of the insertion part after completing cool-fitting being not more than 1000 MPa (Claim 9) and the stress in the periphery of the insertion part after completing cool-fitting to be in 3 to 80% of the stress in the elastic deformation limit (Claim 10) in order to optimize the link strength.

8. Claims **12-14, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Rooij et al. (5,728,021)**, in view of **Mercier (2,844,042)**.

Van Rooij et al. teach a method of manufacturing a power transmission chain including;

a plurality of links (33) having front and back insertion parts (35, 37) into which pins (45) are inserted (col.4, lines 13-14);

and a plurality of pins (45, 47) for connecting the links aligned in a chain width direction so as to be bendable in a longitudinal direction (col.4, lines 11-13, lines 26-29)

such that a front insertion part of one link and a back insertion part of another link correspond to each other (col.4, lines 9-13),

in which a pin is fixed to a front insertion part of one link and movably fitted in a back insertion part of another link so as to enable bending in a longitudinal direction between the links (col.4, lines 14-21) (Claims 12 and 14),

Van Rooij et al. also teach the plurality of pins including a first pin fixed to a front insertion part of one link and movably fitted in a back insertion part of another link

and a second pin movably fitted in the front insertion part of the one link and fixed to the back insertion part of the other link ,

and the power transmission chain is one in which the first pin and the second pin move relatively in a rolling contacting manner (col.4, lines 14-21) (Claim 13).

Van Rooij et al. also teach the power transmission chain being so formed that one of the first pin and the second pin is shorter than the other,

and end faces of a longer pin contact conical sheave faces of a pulley for a continuously variable transmission (col.5, lines 14-17, see Fig. 5) comprising

a fixing sheave including a conical sheave face and a movable sheave including a conical sheave face facing the sheave face of the fixing sheave,

and power is transmitted by a frictional force caused by a contact thereof (col.4, lines 39-45). (Claim 16)

However, Van Rooij et al. fail to teach the method being characterized in fixing a respective pin to a peripheral face of the insertion part of a respective link by shrink-fitting or cool-fitting (Claim 12), and fail to teach shrink-fitting or cool-fitting being performed in a state where the plurality of links are aligned at predetermined intervals in a longitudinal direction and are laminated in a plurality of rows (Claim 14).

Mercier teaches a chain having the concept of fixing of pins (27) to the front and back insertion parts are performed by shrink-fitting (col.3 lines 51-59) (Claim 12), and Mercier also teaches shrink-fitting being performed in a state where the plurality of links are aligned at predetermined intervals in a longitudinal direction and are laminated in a plurality of rows (See Fig.1 and 3) (Claim 14).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the chain taught by Van Rooij et al. to include fixing of pins and fitting method taught by Mercier in order to have a firmer connection between parts.

9. Claim **15** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Van Rooij et al. (5,728,021)**, in view of **Mercier (2,844,042)**, and further in view of **Frost (5,728,021)**.

Van Rooij et al. and Mercier combination teach all structural elements of the claimed invention, as mentioned above, but fails to explicitly disclose a shape of an end face of a respective pin being formed by forging.

Frost teaches a conveyor chain having the shape of an end face of a respective pin being formed by forging (col.1, lines 44-47).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Van Rooij et al. and Mercier to include the pin taught by Frost in order to provide a more reliable structure.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ledvina et al. (5,507,697) disclose a minimal pin projection roller chain with similar features.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nuri Boran ALTUN whose telephone number is (571) 270-5807. The examiner can normally be reached on Mon-Fri 7:30 - 5:00 with first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynda Jasmin can be reached on 571 272 6782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/BRADLEY KING/
Primary Examiner, Art Unit 3683

NBA